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safety element

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SAFETY ELEMENT
OF THE CITY OF FULLERTON
GENERAL PLAN

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Adopted September 17, 1974

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City planning
Fire prev.
Flood control
Crime prevention
City planning
Fullerton

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INTRODUCTION

The Safety Element provides a framework that can be utilized to introduce and formalize safety considerations to the planning process. The major areas of concern are fire safety, aircraft safety, flood control, traffic safety, and crime prevention. Earthquakes and other geologic hazards will be considered in the Seismic Safety Element. These two Elements are closely related and should be considered simultaneously in the planning process.

Reduction of potential loss of life, injuries, and property damage are the main considerations of the Safety Element. Included are an analysis of potential hazards to life and property, goals for reducing the hazards, and objectives for mitigating hazards. The policies stated in this Element reflect the levels of risk felt acceptable at this time based on costs and historical patterns for each area of concern. Evacuation routes in the event of a major disaster are also included.

I. AIRCRAFT SAFETY

A. Background and Potential Hazards

The risk of aircraft crashes is an important consideration in planning for the safety of the community. The Fullerton Municipal Airport handles approximately 250,000 operations per year, including take-offs and landings. Eighty percent of the operations are from east to west and twenty percent from west to east. This means that the majority of the take-offs are over Buena Park. Taking off presents a greater potential hazard than landing. Ninety percent of the operations take place between 6:00 A.M. and 10:00 P.M.

The largest planes using the airport are 18-passenger turbo-prop jets. The majority of the planes are relatively small and therefore any damage from a crash would be fairly localized. Since 1960, there have been six significant aircraft crashes within the City of Fullerton. Only two of these have included fatalities or injuries (see figure 1). There have been no injuries or fatalities to people on the ground as a result of aircraft crashes, and only minimal property damage. No residences have been hit.

The flight pattern under normal conditions includes an area approximately one mile north and parallel to the runway and extends for an indeterminate distance. There is a clear zone of 1,000 feet at each end of the runway. Height limitations for natural and man-made objects around the airport were approved by the City Council in 1957. However, since then the runway has been extended and the height limitations have not been revised. Most problems may be expected to occur in and around the normal flight patterns.

Within the area of influence of the Orange County Airport Land Use Commission (see figure 1), the Land Use Element of the General Plan of the City of Fullerton has been adopted as the land use pattern to be followed. The area is planned for mostly industrial use with some low-medium density residential.

B. Goals

To reduce the possibility of loss of life, injuries, or property damage due to airplane crashes.

C. Objectives

To restrict land use around the airport in order to minimize potential loss of life, injuries, and property damage due to airplane crashes.

To impose limitations on buildings and landscaping around the airport to avoid interference with normal flight operations.

D. Policies

Maintain current Land Use Element as adopted by the City Council.

Revise the height limitations in the Fullerton Municipal Airport Obstruction Plan, Precise Plan P-138.

If the normal flight operations of the airport change, consideration will be given to the surrounding land use patterns with regard to safety.

X ACCIDENTS INVOLVING FATALITIES

O ACCIDENTS INVOLVING NO FATALITIES OR INJURIES

AREA OF INFLUENCE WITHIN FULLERTON

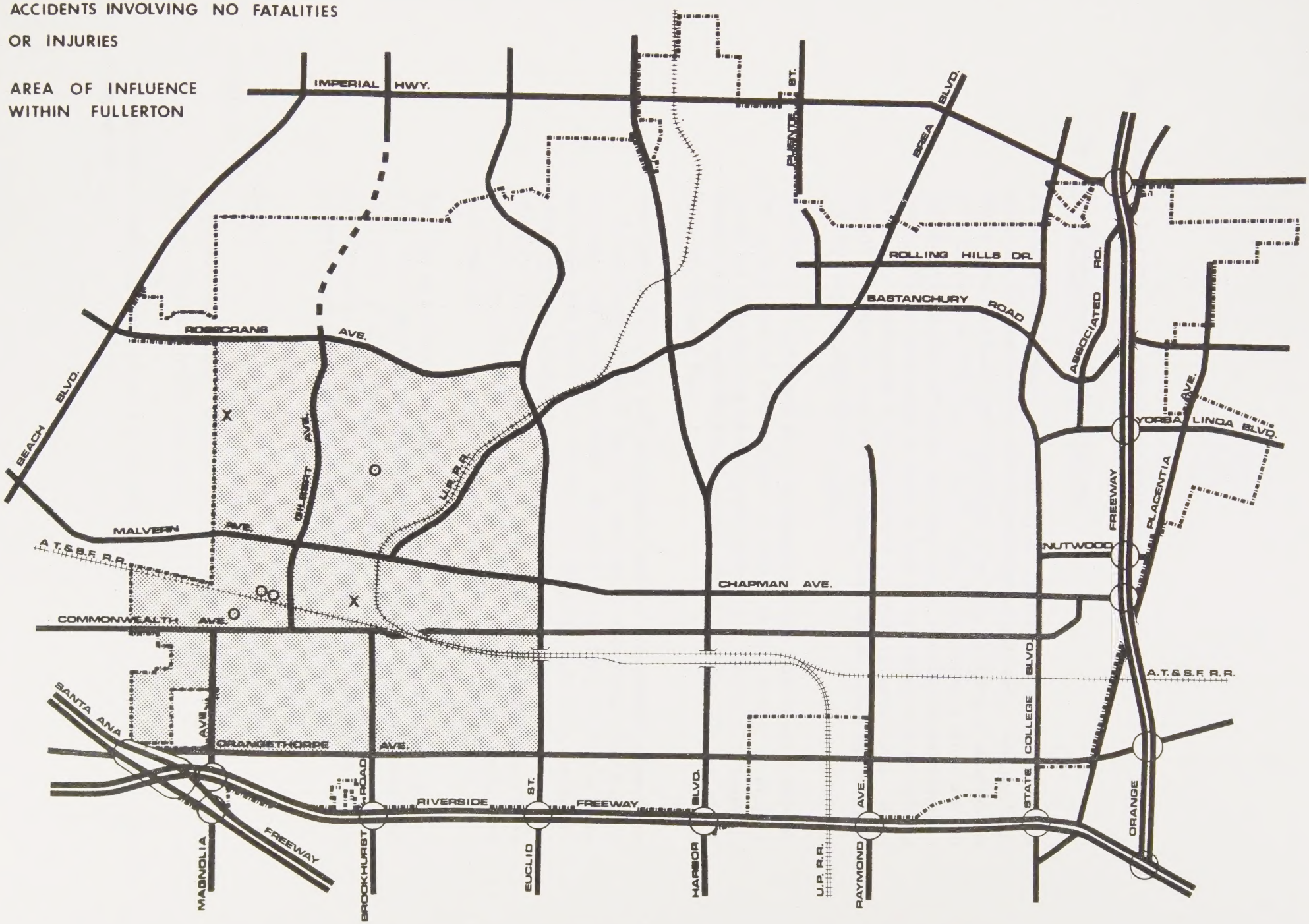

FIGURE 1

II. TRAFFIC SAFETY AND CRIME PREVENTION

A. Background and Potential Hazards

As one would expect, the majority of traffic accidents in Fullerton occur on the most heavily traveled arterials and at major intersections. There have also been some accidents involving collision of automobiles with trains. The more hazardous situations include streets which are too narrow, which have on-street parking, where visibility is obstructed by landscaping or structures, and which lack grade separations at railroad crossings. Inadequate lighting presents a hazard to pedestrians. Also, certain varieties of trees and shrubbery drop debris which can obstruct the walkways or make them slippery.

The mixture of autos and bicycles present a safety hazard and interrupts the normal flow of auto traffic. A system of safe routes for bicycle travel has been developed and approved by the Fullerton City Council. These routes are described and mapped in the Bikeways Element of the Fullerton General Plan.

The areas in Fullerton with the highest rates of preventable crimes* are in the southern portion of the City between Orangethorpe and Chapman Avenues, and in the apartment complexes around the California State University (see figure 2). Situations which encourage crime are inadequate lighting, landscaping which provides concealment, building entrances which are not visible from a patrolable street or driveway, doors and windows which are easily pried open, dead-end alleyways, and street parking.

The City of Fullerton employs 1.32 police officers per 1,000 population. This is slightly less than the recommendation by the International Association of City Managers of 1.4 per 1,000. The Police Department plots the areas with the most crimes on a map each month, and adjusts assignments of patrol units accordingly.

B. Goals

To protect the general health, welfare, and safety of the community against crime and traffic accidents.

*Preventable Crimes are those which can be detected by patrol units while they are happening.

C. Objectives

To discourage crime through effective physical planning.

To provide for the safety of motorists and pedestrians by reducing existing hazards and avoiding future hazards.

D. Policies

1. Streets and Land Subdivisions

Provide easy vehicle access to all buildings for emergency purposes.

Provide adequate street lighting.

Provide for maximum observability of building entrances and windows.

Avoid dead-end alleyways.

Provide a sufficient number of major through streets and local residential connecting streets to facilitate emergency responses. Each neighborhood should have two separate entrances for emergency access.

Maintain bikeways as described in the Bikeways Element of the Fullerton General Plan.

Utilize landscaping which allows for visibility as well as enhancing the environment.

Provide grade separations at railroad mainlines and all arterial highways as proposed in the Circulation Element of the Fullerton General Plan.

Maintain standards for minimum road widths as proposed in the Circulation Element of the Fullerton General Plan.

Maintain setbacks as described in the City of Fullerton Zoning Ordinance.

HIGH CRIME AREAS

6 TO 8 CRIMES PER MONTH

8 TO 10 CRIMES PER MONTH

OVER 10 CRIMES PER MONTH

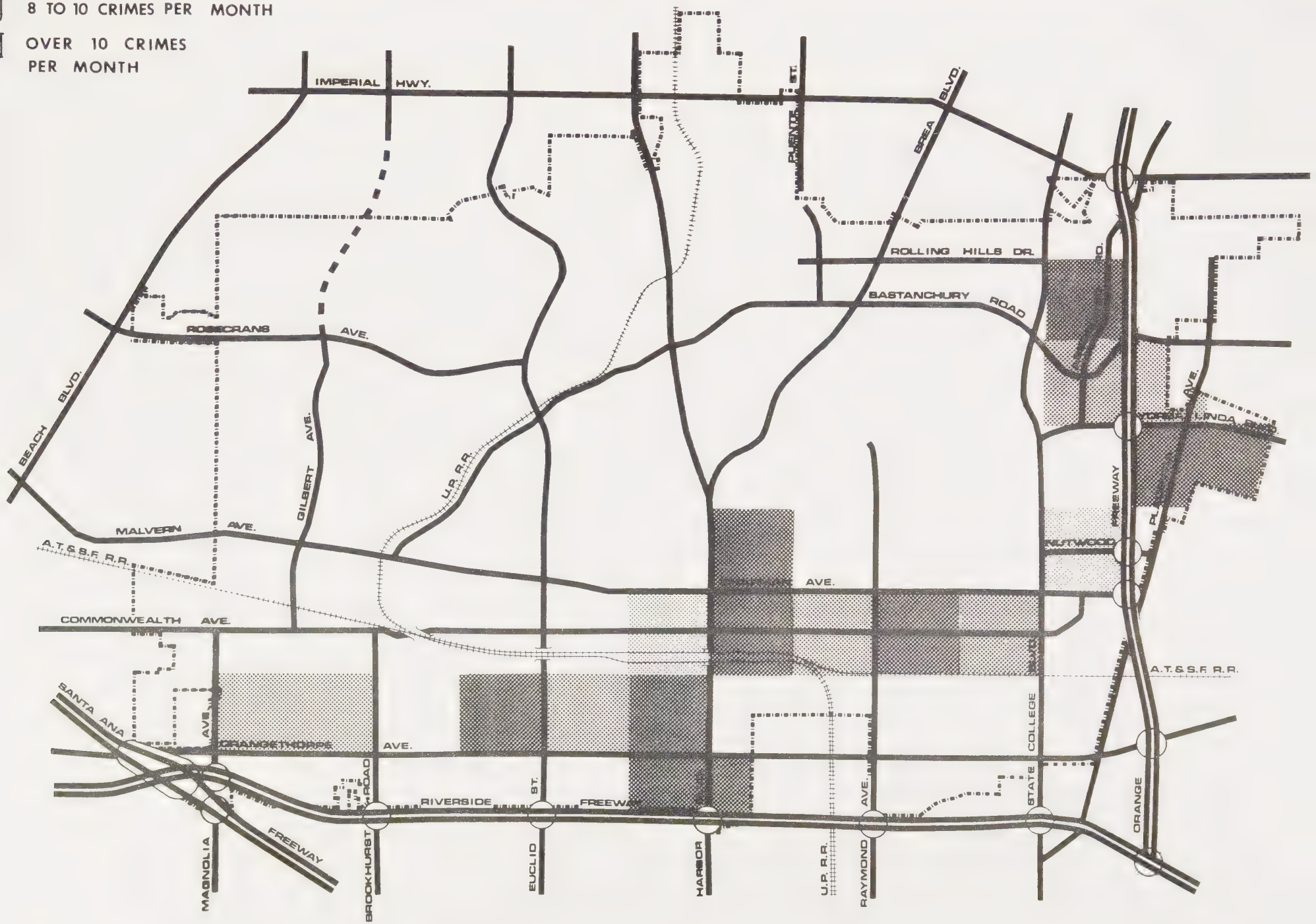

FIGURE 2

Avoid trees which are susceptible to breakage in high winds.

Conduct annual traffic signal surveys to set priorities for locations of traffic signals in accordance with the Capital Improvement Program.

Priority in capital improvements to streets should be in relation to the highest accident rates.

In any new residential area, where traffic is sufficient to warrant traffic signals, the developer will be required to provide traffic signals.

2. Parking

Maintain adequate ordinance requirements which will insure off-street parking wherever possible.

Require adequate lighting in parking areas.

Locate all public parking lots in areas where the public need is the greatest.

Utilize landscaping which allows for maximum observability by patrol units in parking lots.

Encourage development of driveways in residential areas which are long enough to allow off-street parking and maneuverability for opening garage doors without blocking sidewalks.

3. Structures

Provide adequate lighting at building entrances.

Provide for maximum visibility of building entrances.

Minimize access to roofs of industrial and commercial structures.

Encourage the use of visible house numbers and street addresses to facilitate emergency responses.

4. Walkways

Locate walkways in nonisolated areas.

Provide walkways which do not hinder adequate visibility.

Provide adequate lighting for all public walkways.

Provide for vehicle access close enough to walkways and park areas to facilitate emergency responses.

Avoid trees and shrubbery which drop excessive debris and damage sidewalks.

III. FIRE SAFETY

A. Background and Potential Hazards

Fullerton has approximately 32,231 residential units within its City limits ranging from small single-family dwellings to several-hundred-unit apartment complexes. The greatest number of structural fires occur in dwellings, therefore, as the population increases, we can expect a corresponding increase in the number of fires. Fullerton has commercial and industrial occupancies ranging from small retail stores to major industrial plants, such as Kimberly-Clark and Hunts Foods. While the number of fires in the commercial and industrial occupancies are not high, they represent an extremely large potential fire loss which requires large numbers of men and equipment to minimize the damage.

The buildings of high occupancies, such as schools, hospitals, rest homes, theaters, and churches represent a high potential loss of life and require continuous inspection and control. During the past ten years, twenty-three people have lost their lives from fire in the City of Fullerton. Most of these lives were lost in dwelling fires. Fullerton has a major section of undeveloped oil-producing land within its City limits which is covered with grass and light brush. The potential fire loss from this type of fire is low. The type of vegetation which is on these lands does not develop the extreme heat which results in fast-burning and quickly-spreading fires. Fire breaks are maintained throughout the grass and brush areas to limit the spread of fire and to aid in the extinquishment operations.

Fullerton's climate has long periods of hot, dry weather combined with seasonal high-velocity desert winds creating a severe potential for large spreading fires in both the residence structures, and the grass and brush areas. Closely built structures, with wood shingle roofs, are particularly vulnerable to this climatic condition. Fullerton has a Municipal Airport which is used mainly by smaller private-type aircraft and, although this does not pose a great fire problem, specialized equipment must be maintained to cope with aircraft rescue and fire-fighting operations.

The City of Fullerton maintains six fire stations with six pumpers, one 85-foot aerial ladder, and one airport emergency vehicle. Emergency response time generally ranges from two to four minutes. The greatest distance between any point in the City and the nearest fire station is approximately two miles. In 1969, Fullerton was graded by the

Insurance Services Office, and was given a Class 3 fire insurance rating throughout the City, except for Fullerton College Campus. This area was given a Class 9 fire insurance rating because of inadequate water supply due to lack of fire hydrants on campus. Two major railroads have rights-of-ways through the City. A delay in response time could be caused by lack of underpasses. Emergency equipment could be forced to use alternate routes, or wait for trains to pass, which could result in loss of life or larger fire losses.

B. Goals

To protect the general health, safety, and welfare of the community against fire and natural disaster.

To maintain an adequate fire suppression force which can effectively extinguish both large and small fires, and therefore (a) provide a fire-safe community for the residents, (b) provide an attractive commercial and industrial location, and (c) qualify for low fire insurance rates.

To strive to maintain no less than a Class 3 fire insurance rating.

C. Objectives

To minimize the loss of life, injuries, and property damage through a continuing fire prevention, inspection, and public education program, and to create a public awareness of the disastrous economic impact that fire has on a community.

To maintain a high level of proficiency including the latest and most effective methods in fire attack and extinguishment.

D. Policies

To provide fire emergency access to all future development and to avoid structures which would require excessive costs to provide fire protection.

Continually upgrade fire safety standards in the Uniform Fire Code, and to promote the installation of fire protection equipment within structures wherever possible.

Continue to promote the upgrading of the water system to conform to Insurance Services Office standards for hydrant spacing and fire flow requirements for all areas of the City.

Support the extension of arterial streets where practical to provide a shorter response time to the north-central area of the City.

IV. FLOOD CONTROL

A. Background and Potential Hazards

The City of Fullerton, through the Department of Public Works, has established the criteria that the first floor elevations of all buildings be set so they will not be flooded during a ten-year storm. Local storm drain facilities are required in those situations where run-off from a ten-year storm cannot be carried within the curbs.

The most likely flooding occurrence in Fullerton would be overflowing of existing system channels. In Fullerton, these main drainage arteries follow the low areas of four main drainage basins. These are shown in figure 3, and are described as the Brea Creek System, the Fullerton Creek System, the Placentia System, and the Imperial System.

In terms of flow, the largest of local drainage systems is Brea Creek. This system has at its upper reach an earth fill dam, Brea Dam, which has recently been restudied by the U. S. Army Corps of Engineers and determined to be undersized for the standard project flood that could be expected to reach that facility from upstream areas. Better methods of research and recently compiled storm statistics have been programmed into a model by the Corps of Engineers. By mathematical means, the programmed storms' effect on the holding capacity of the Brea Dam Reservoir was determined. The result was that unless an additional outlet is provided downstream, the standard project flood will exceed the capacity of the basin and overflow the spillway. While the standard project flood is a very rare occurrence, with probability in the 1 to 300 range, much of Fullerton is vulnerable due to this inadequate dam.

Downstream of Brea Dam is a concrete channel which was constructed during the 1930's. The flow from the reservoir behind Brea Dam outlets into this channel as does flow from streets and drains from surrounding areas downstream of the dam. The flow coming from the Brea Dam outlet plus the downstream inflow will overtop the downstream channel if a fifty-year storm occurs. As can be seen from figure 3, any major flooding of the Brea Creek system will affect about 30% of the City. The probability of this happening is reasonably high--about 1 in 50.

Only on the very far downstream reach has the channel been constructed to a capacity which will handle the Brea Dam standard flood discharge plus the anticipated inflow from the City tributary area downstream of the dam.

The Fullerton Creek system similarly has a Corps of Engineers earth fill dam at its entrance near the north City limits of Fullerton. Also, as in the case of Brea Dam, the Fullerton Dam does not have sufficient reservoir capacity to contain the standard project flood.

Downstream, Fullerton Creek Channel has a large reach of highly erodable earthen channel, a section of concrete channel which will be overtopped by about a ten- to fifteen-year flood, and in the most southwesterly reach, a section which can handle somewhat over a 25-year storm. The Fullerton Creek system serves about 55% of the City of Fullerton, so it can be seen that major flooding would affect a substantial area. Figure 3 shows this system. Dam protection that is substandard and channel facilities with odds of overflow at 15 or 20 to 1 are highly undesirable situations for the community.

The Placentia and Imperial system flood plains represent about 10% of the area of Fullerton. Neither is protected by an upstream dam. Each has a channel facility with design protection in the 25-year category. Obviously a flood of higher magnitude will overtop these facilities, subjecting adjacent areas to flooding.

There are hundreds of other drains and channels throughout the City which are tributary to these four main drainage systems. A large part of the City's minor system is in need of enlarging to bring up the adjacent level of protection. Since many of the major facilities are not under City control, it comes down to the fact that besides pressure and appeals, there is little of the Fullerton flood hazard, except the local drains, that can be solved by the City. Table No. 1 puts the jurisdictional problem in perspective and also shows the current level of protection provided by the major facilities which protect the City.

Studies are currently under way analyzing the efficiency of the flood control systems affecting the City of Fullerton. Should the results of these studies indicate changes to the above descriptive section, necessary changes will be made.

B. Goals

To protect the community against loss of life, injuries, and property damage due to flooding.

MAJOR DRAINAGE SYSTEMS

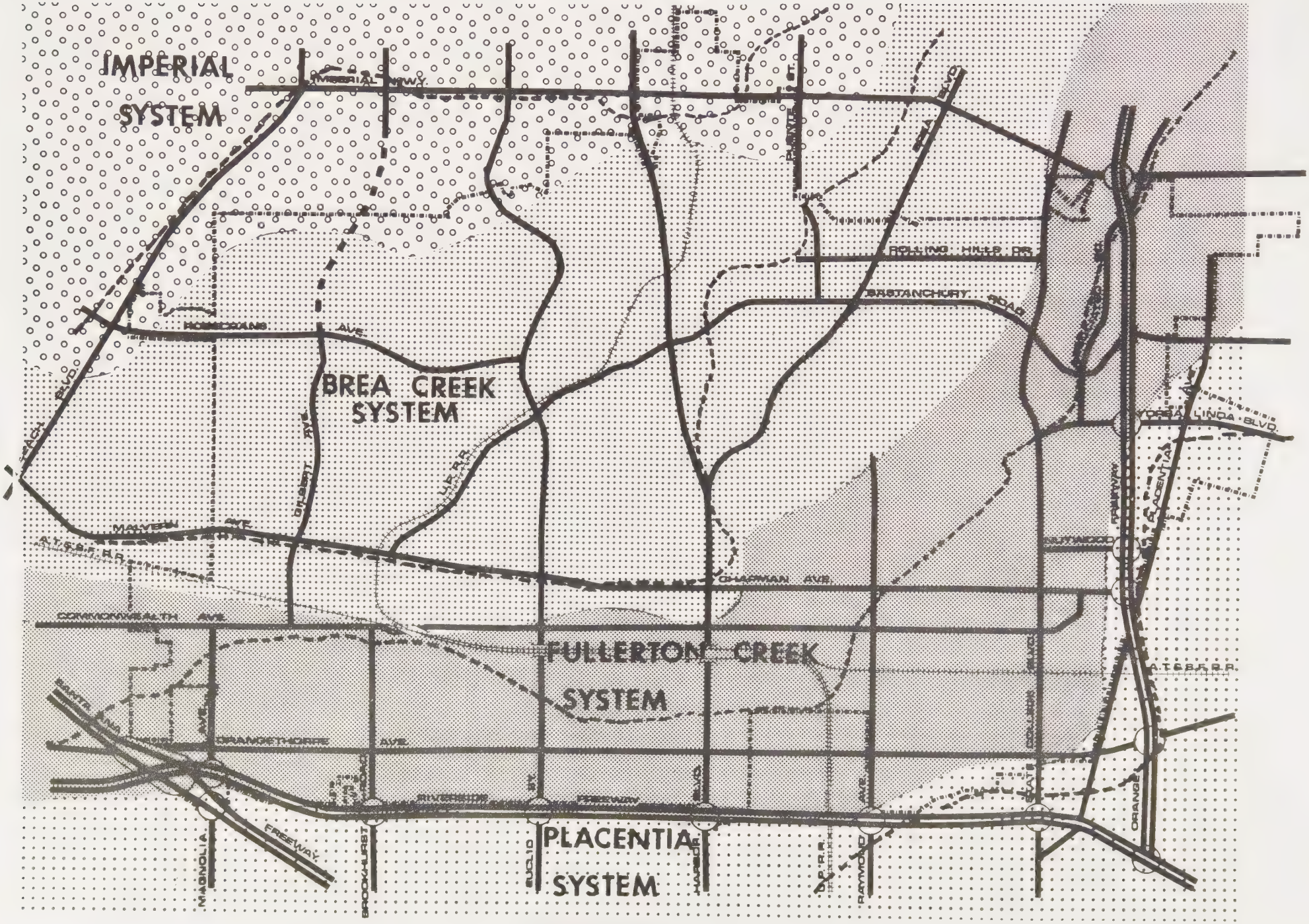

FIGURE 3

TABLE 1

Jurisdiction and Levels of Protection for Major Flood Control Facilities that Affect the City of Fullerton

Facility	Section or Reach Under Consideration	Current Recommended Level of Protection	Current Actual Level of Protection	Responsible Agency
Prado Dam	Basin	Project Flood	70 Year	USCE
Santa Ana River	Above Prado	Project Flood	-Project Flood	USCE & OCFCD
Santa Ana River	W/o Imperial	100 Year	30 Year	USCE & OCFCD
Brea Dam	Basin	Project Flood	-100 Year	USCE
Brea Creek	E/o Bastanchury	25 Year	25 Year	OCFCD
Brea Creek	W/o Bastanchury	Project Flood	*Project Flood	OCFCD
Fullerton Dam	Basin	Project Flood	-100 Year	USCE
Fullerton Creek	E/o Harbor Blvd	100 Year	-10 Year	OCFCD
Fullerton Creek	W/o Harbor Blvd	100 Year	+25 Year	OCFCD
Placentia Channel	All	25 Year	25 Year	OCFCD
Imperial Channel	All	25 Year	25 Year	OCFCD
Toussau Channel	All	25 Year	8 Year	City
Houston Channel	All	25 Year	10 Year	OCFCD
Raymer Channel	All	10 Year	-5 Year	City
Associated Channel	All	25 Year	10 Year	City
Kimberly Channel	All	25 Year	+8 Year	City
Bastanchury Channel	All	**25 Year	-10 Year	City
Euclid Channel	All	10 Year	+5 Year	City
Arroyo Channel	All	10 Year	+8 Year	City
Los Coyotes Channel	All	25 Year	+10 Year	City & Buena Park
Balcom Channel	All	10 Year	8 Year	City

Under Construction
Under Consideration for Brea Dam Bypass

TABLE 1

TABLE NO. 1 (Continued)

Commonly used flood or storm designations listed in ascending order of severity.

Designation	Statistical Probability
10-Year	once in 10 years or 10% chance of occurrence
25-Year	once in 25 years or 4% chance of occurrence
50-Year	once in 50 years or 2% chance of occurrence
100-Year	once in 100 years or 1% chance of occurrence
Standard Project	*
Probable Maximum	**

* Standard Project Flood: Expected rarely. Flood that would result if most critical storm which is characteristic of that region were to occur over basin reasonably favorable to run-off.

** Probable Maximum Flood: Extremely unlikely. Greatest flood that would result from most severe, yet possible, combination of meteorological and hydrological conditions.

C. Objectives

To minimize the potential loss of life, injuries, and property damage in the event of a major flooding of the Santa Ana River and other regional facilities.

To prevent flooding due to local drainage deficiencies, so that life and property will be protected in the event of excessive run-off by building adequate flood control facilities.

D. Policies

Continue the normal public works construction program as outlined in the Five-Year Capital Improvement Program as annually updated.

Prepare a complete study of the flood and drainage situation in the City to determine areas of flooding under different storm frequencies.

Map all known flood hazards in the City to insure that citizens are aware of the risks.

Undertake a concerted and prolonged effort to obtain needed flood control projects which are under Federal and Flood Control District jurisdiction.

Develop and implement a framework for emergency operations during flood conditions, including critical items such as command center location, responsibility for control, special equipment needs and location, evacuation, food, health and shelter service, and clean-up procedures.

Establish a level of protection for streets acting as access to emergency facilities, ground floors of all critical and emergency facilities, and parking lots for these facilities.

V. EVACUATION ROUTES

The possibility of a disaster of such magnitude that the City would have to be evacuated cannot be ignored. If such an event were to occur, major arterial streets would be used as evacuation routes. These are shown in figure 4. Also shown are emergency facilities including hospitals, fire stations, and the Police Department.

The City shall develop evacuation routes from all major residential areas in case of local disasters.

In the event of a major emergency the Emergency Services Plan for Orange County will be used as an emergency plan for Fullerton.

H HOSPITALS

F FIRE STATION

P POLICE DEPARTMENT

EVACUATION ROUTES

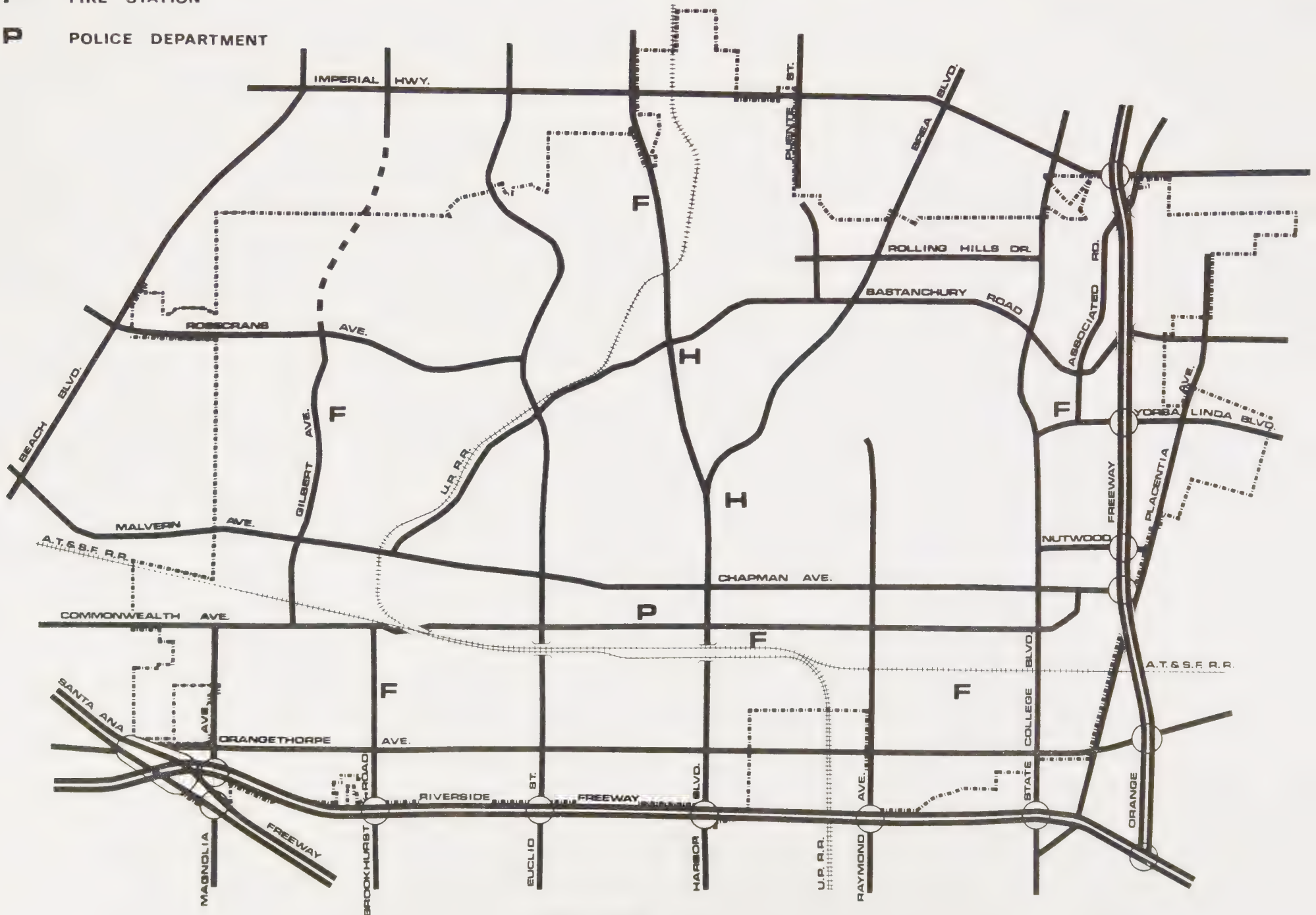

FIGURE 4

CONCLUSION

The purpose of the Safety Element is to examine the potential safety hazards existent within the City and determine if possible mitigating measures are being taken or if not, propose such measures. The general conclusion which can be drawn from this examination is that the City of Fullerton, with those few exceptions noted above, has taken or is taking the necessary precautions based on possible safety hazards. It should be noted that seismic hazards are not addressed in this document but are left to the Seismic Safety Element to be prepared and adopted separately.

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